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Dependence of the self-diffusion coefficient of liquid molecules in a porous medium on its geometric parameters

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Abstract

Based on the most general concepts of the translational mobility and geometry of a porous medium, an expression is derived for the self-diffusion coefficient of liquid molecules in such a medium. An analytical relation between the self-diffusion coefficient and the effective geometric parameters of the pores, as well as the sizes of diffusant molecules, is proposed. The derived expression agrees well with experimental results.